

Abstract of the Disclosure

The invention provides improved methods and systems for a precise and selective cross-talk cancellation and pilot tones deletion in optical amplifiers. The method for cancellation of cross-talk among multiple channels occurring in a traditional optical amplifier comprises: detecting tones at an input and an output of a Smart Optical Amplifier that includes a traditional optical amplifier and a Cross-talk Cancellation Unit; comparing the detected tones at the input and output of the Smart Optical Amplifier; generating destructive tones with such amplitudes and phases so as to cancel cross-talk; and eradicating cross-talk at the output of the Smart Optical Amplifier by applying the destructive tones in the Cross-talk Cancellation Unit. Eight different embodiments that correspond to different combinations of traditional optical amplifier types and the type of technology (analog or digital) used in processing and control of signals are described.